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THE MIAMI CONSERVANCY BULLETIN

November 1918

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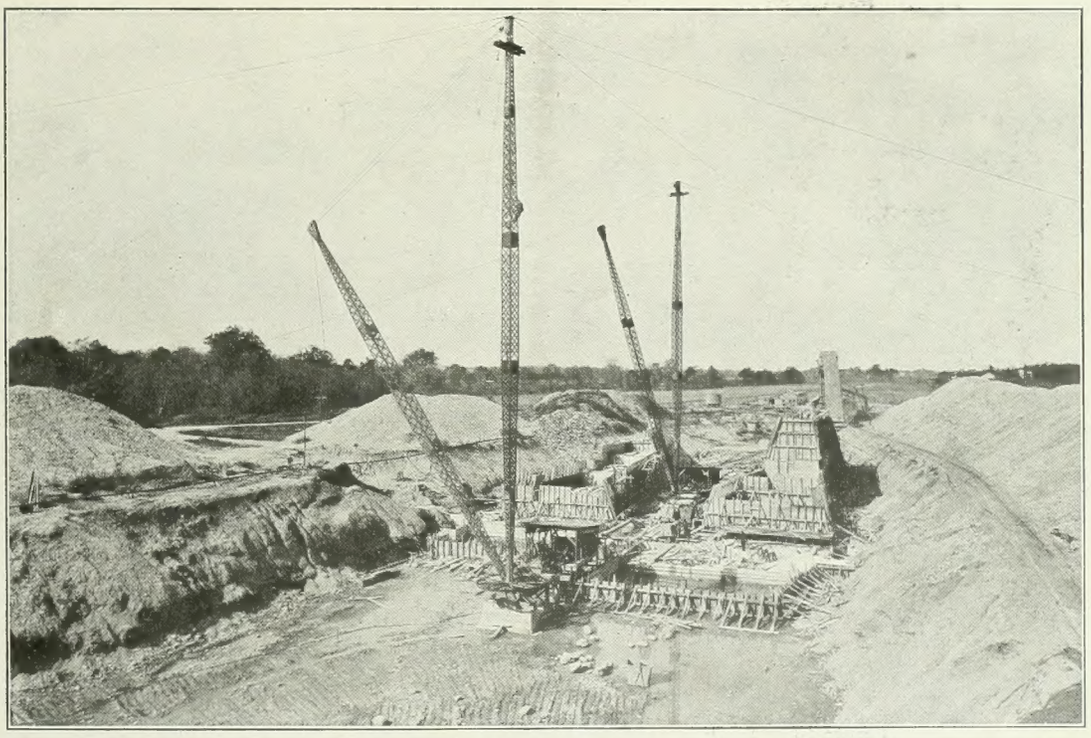

THE LOCKINGTON LAYOUT AS SEEN FROM THE ROOF OF THE DRAGLINE

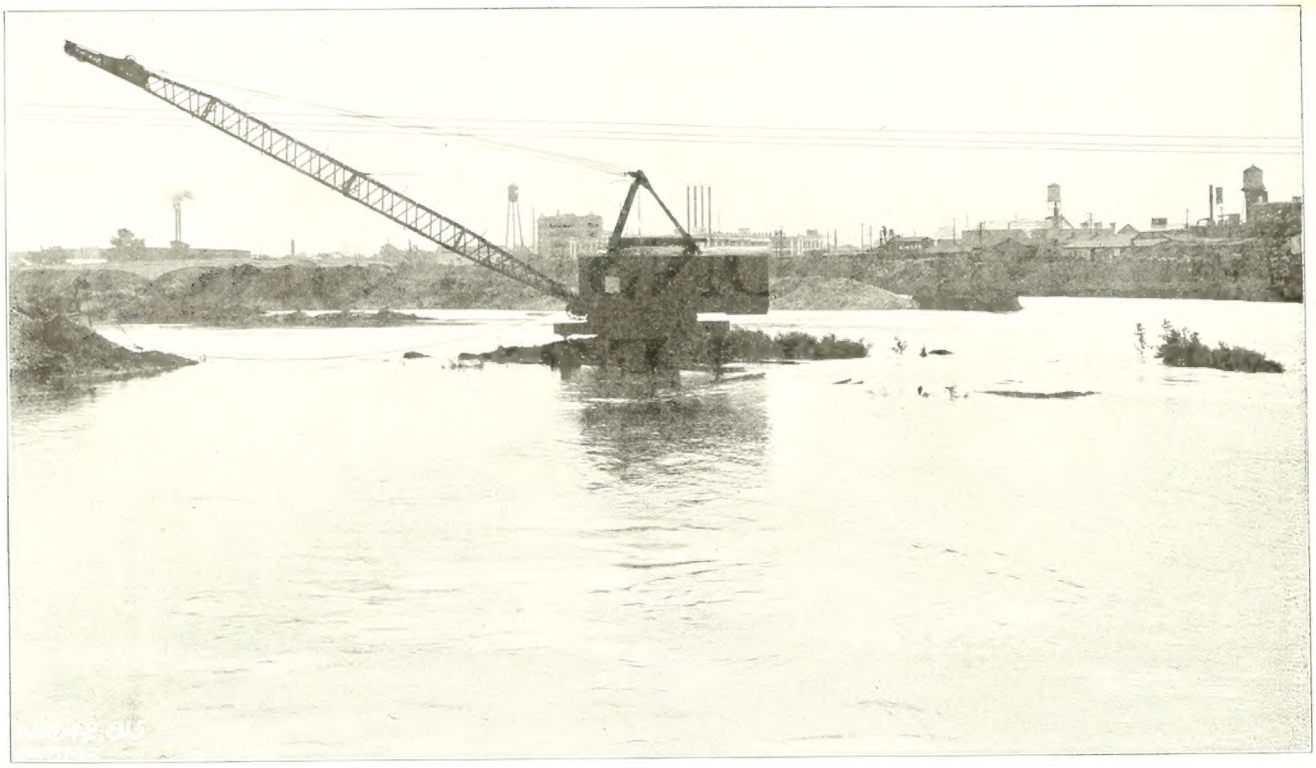

FIG. 50—"A DRAGLINE IN THE ATTITUDE OF PRAYER"

A Bucyrus machine caught in one of the swift rises characteristic of the Miami River at Dayton. The picture shows the unavoidable danger to which the Conservancy river equipment is sometimes exposed. No harm resulted in this case.

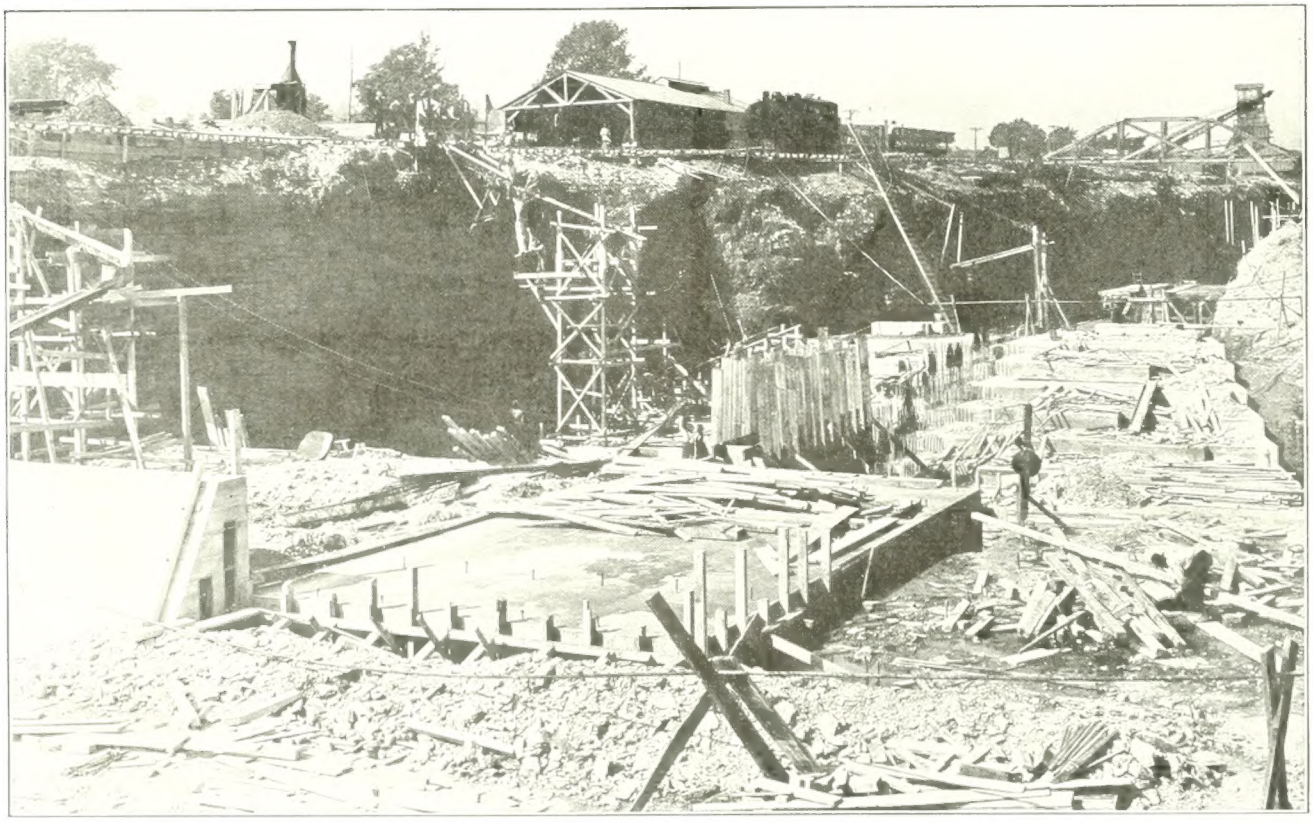

FIG. 51—CONCRETING THE OUTLET STRUCTURE AT THE ENGLEWOOD DAM

The view is looking upstream with the river out of sight at the right. The cross wall at the left is the downstream weir of the lower pool, the concrete floor in the foreground being the floor of that pool. The floor of the standing wave pool can be seen at the right beyond it, with the concrete stairway rising in the rear.

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THE

MIAMI CONSERVANCY BULLETIN

PUBLISHED BY THE MIAMI CONSERVANCY DISTRICT

DAYTON, OHIO

Volume 1 November 1918 Number 4

To the Men of the Conservancy District

We feel that we cannot let the occasion go by without expressing our unusual sense of satisfaction at the manner in which the men of the Conservancy District have carried through the Fourth Liberty Loan. It is a record in which all of us can take a just pride. The thing which was given our men to do they have done, and done exceedingly well. We feel the more bound to express this because the matter has so deep a meaning. Our government is engaged in putting through the biggest and most important job which has ever been done in the world, and it is doing it in a manner which commands the admiration of the world. That job is our job also. We have our part in it, and the manner in which we have carried through the Fourth Liberty Loan gives gratifying assurance that in doing our part, in the future as in the past, we shall not fall down.

ARTHUR E. MORGAN, Chief Engineer.
CHARLES H. PAUL, Asst. Chief Engineer.
C. H. LOCHER, Construction Manager.

Obituary—William A. Obrein

Word has just been received of the death of Wm. A. Obrein of Cape Girardeau, Missouri, on October 12.

Mr. Obrein was Chief Engineer of the Little River Drainage District in Missouri, an undertaking to drain and prevent floods on an area of six hundred square miles. He has been untiring in his efforts and has maintained a high standard of workmanship throughout this great project. The works of the Little River Drainage District will stand as a monument to his memory.

During the development of plans for the Miami Conservancy District, Mr. Obrein was a member of a special Consulting Board, which examined and passed on the plans of the District.

ARTHUR E. MORGAN.

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Subscription to the Bulletin is 75 cents per year. At news stands 10 cents per copy. Business letters should be sent to L. F. Wilcock, Assistant Engineer, Miami Conservancy District, Dayton, Ohio. Matter for publication should be sent to G. L. Teeple, Miami Conservancy District, Dayton, Ohio.

The Work at Lockington

All Necessary Gravel Obtained from the Excavation. Top of Bed Rock Furnishes Excellent Foundation. Working Layout Simple and Efficient.

Necessity dictated the location of the Lockington Dam across the wide, flat valley of Loramie Creek, which does not present the bold approaching shoulders of a natural dam site. The best location, and the one finally selected, is about 1½ miles above the junction of the creek with the Miami River, and about three-eighths of a mile north of the village of Lockington. The dam, which is to be built of earth, is 954 feet above sea level at the crest. It is 7,000 feet long, 440 feet thick at the base, 74 feet in height above the valley floor, and will contain 974,000 cubic yards of earth. With the maximum flood provided for, the water in the retarding basin would back up the valley behind the dam, diagonally northwest, nearly across Shelby County. With a flood equal to that of 1913, 3,600 acres would be covered to an average depth of 17½ feet, making a total volume of 63,000 acre feet, an acre foot being the amount of water necessary to cover one acre one foot deep.

Most of the earth will be deposited in the dam by the "hydraulic fill" method. It will be obtained from shaded area, labeled "borrow pit" in figure 53, comprising about 40 acres. This land is at such elevation that when the earth has been loosened by a powerful stream of water from a nozzle or "giant," it can be washed or sluiced down a five per cent grade to the pit or "sump," (so marked in the figure) near the upper toe of the dam. From this sump, the material, mixed with enough water to carry it, will be pumped by dredge pumps through pipes to a long pool maintained during construction on the top of the embankment. The admixed earth falls to the bottom of the pool, thus building up the dam. The excess water will be drawn off through openings provided into the creek below the dam. The water necessary for these operations will be pumped from the Miami and Erie canal, conveniently situated a little to the east of the borrow pit.

The hydraulic fill at Lockington will not be started until next season. The work now in progress is on the concrete structure for carrying the water of Loramie Creek after the dam is completed. By building this now it will carry the creek water also during dam construction.

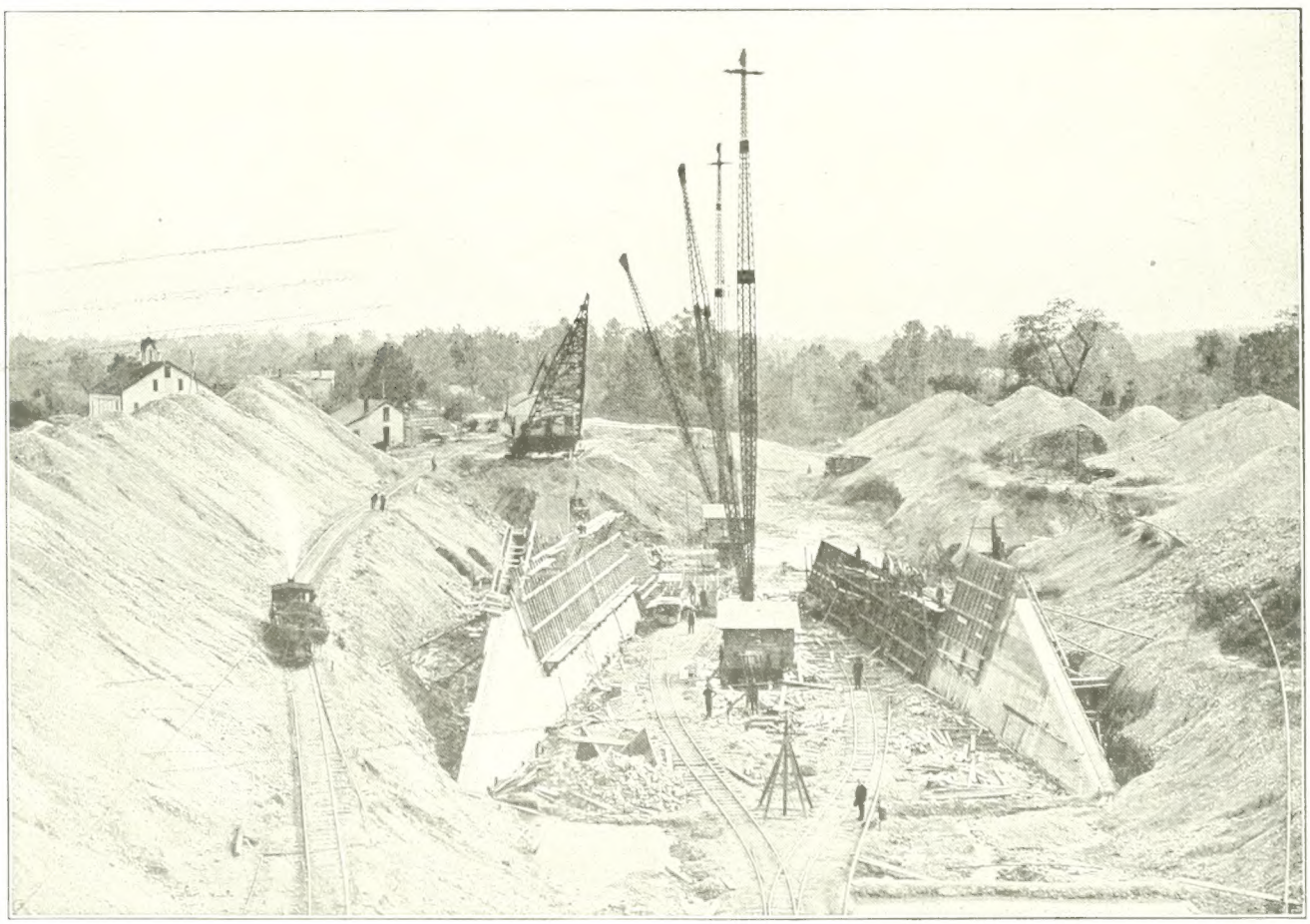


FIG. 52—THE WORK AT LOCKINGTON AS SEEN FROM THE TOP OF THE GRAVEL WASHER

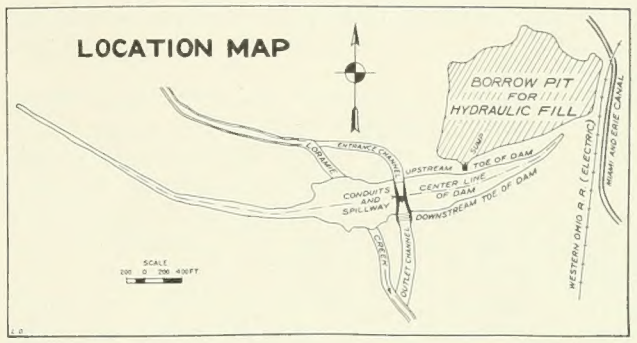
The two walls are the retaining walls of the concrete entrance channel. The entrance to the conduits through the concrete cross dam will begin just beyond the first derrick mast. The gravel stock pile is at the left, the gravel track beside it, with the dragline excavator in the distance. The tracks in the center are the concrete tracks.

The conditions for building it are very favorable. Bed rock occurs to the east of Loramie Creek, only a few feet below the elevation of the creek bed, with a floor almost as level as it could be laid out with an instrument, and so firm that under the greater part of the outlet structure it furnishes an excellent foundation simply by cleaning off the superimposed earth. Solid rock is nowhere more than a foot or a foot and one-half below the rock surface. Gravel for the concrete is obtained directly from the excavation necessary to reach the bed rock. The gravel has been piled in a long bank to the east of the excavation. The waste earth has been piled on the west side where it will become a part of the embankment of the dam. Comparatively little water collects in the bottom of the excavation, so that the concrete structure can be built "in the dry." This obviates the use of expensive coffer dams, such as are often necessary to keep water out in such work.

The building of the concrete structure, now well under way, is the principal work to be done at Lockington during the present season. Its purpose, as stated, is to provide an outlet through the dam for the waters of Loramie Creek. Its sides are formed of two heavy concrete retaining walls, passing entirely through the earthen embankment of the dam, from its upstream to its downstream toe, and from its bottom to its top. These walls are parallel to each other at the middle of their length, but diverge at each end to facilitate the entrance and exit of the water. The space between them, forming the channel for the stream, is floored with concrete placed on bed rock, and blocked across the center by a very heavy cross wall pierced with two openings at the bottom which carry the water. These openings are rectangular in shape, 9 feet wide by 9 feet 2 inches high, and placed side by side. They will carry the water except during extraordinary floods. To safeguard against the latter, a third opening, or "spillway," is provided at the top, an open concrete channel 16 feet deep and averaging 77 feet wide, its sides being the two retaining walls and its floor the top of the cross wall. The entire structure is 82 feet in height, 140 feet in maximum width, and about 500 feet from its upstream to its downstream end. It will contain 38,000 cubic yards of concrete. To provide still more abundant water way during construction of the earthen part of the dam, so as to avoid any possible danger of overflow, the concrete cross wall will not be built until after the earthen part of the dam is completed.

Besides the building of the forms, which will not be here touched upon, the concrete construction involves the following processes:—excavating the earth down to solid bed rock; transporting gravel and cement to the screening and mixing plant; washing and screening the gravel; mixing the gravel and cement to form concrete; transporting the concrete to the structures; and depositing the concrete in the forms. The working layout for these various operations is shown in the plan, figure 53.

Excavation to foundation rock, of course, comes first. This is being done by a Class "K" Lidgerwood dragline excavator, which is now at the point marked "large drag line" in figure 53, the excavation north of it having been completed. This is an electric dragline with 170 H. P. motor capacity, a 100-



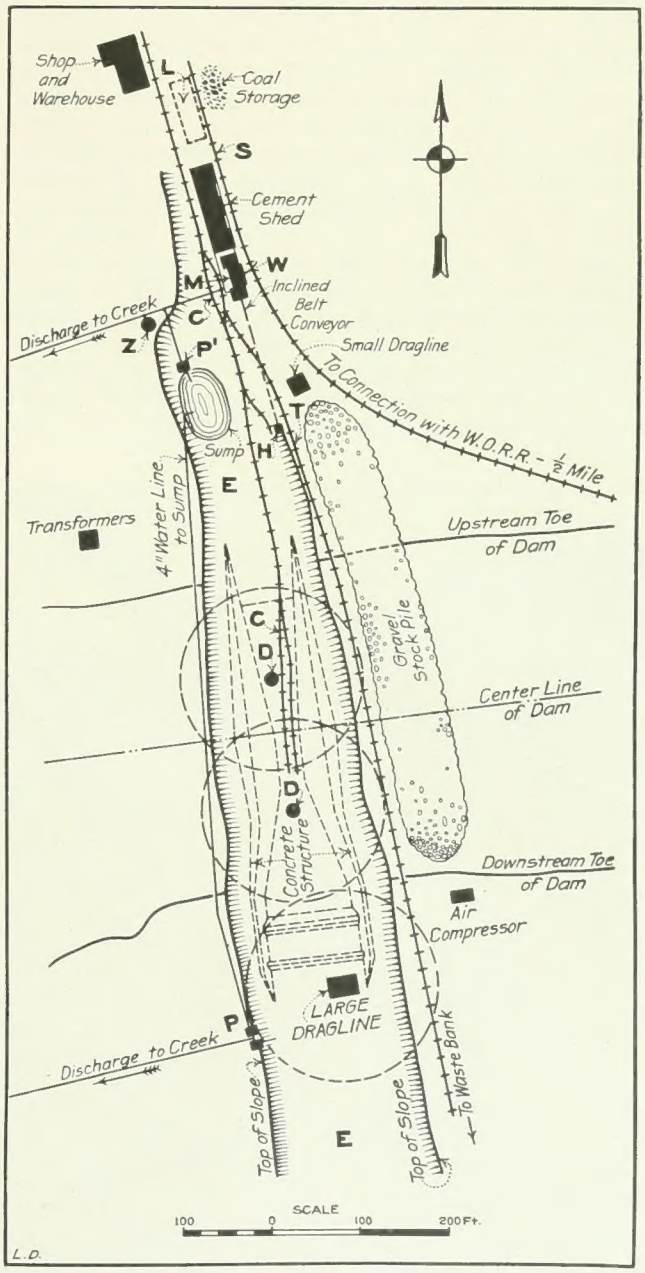


FIG. 53—PLAN OF LOCKINGTON LAYOUT

EE, excavation for new channel, the concrete structure now building shown in outline by dashed lines in the middle of it. Downstream end is below. DD, derricks. CC, concrete tracks. T, gravel track. H, gravel hopper. W, gravel washer. M, concrete mixer. S, electric railway service track. L, lumber yard. PP', pumps supplying gravel washer. Z, reserve water tank.

foot boom, and a 2½-cubic-yard bucket. It will excavate 50 buckets, or about 100 wagon loads per hour.

The gravel is carried in 4-yard Western dump cars by an 18-ton Porter "dinkey" locomotive, running on the track "TT." This track runs on a shelf or berm between the gravel stock pile and the edge of the excavation. At present the gravel is dumped into these cars directly from the excavation by the large dragline. Later it will be obtained from the gravel stock pile. It will be handled then by a small dragline, (shown in figure 53, just north of the pile), thus releasing the large machine for other work.

The gravel is dumped from the cars into the hopper "H," whence it is carried up an inclined conveyor belt to the top of the gravel washer, marked "W," where it is dumped into another hopper; thence it passes successively through three conical revolving steel screens, assorting it into four different sizes, which are collected in bins. While passing through the screens, it is sprayed by streams of water from nozzles which wash it clean of earthy impurities. The screens are sheet steel cones pierced with holes, and sort out successively stones above 3-inch size, then between 3-inch and 1½-inch, then between 1½-inch and ¼-inch, and last, the sand smaller than ¼-inch. All silt and impurities are carried off with the wash water.

The cement is brought in over the service track "S," connecting with the Western Ohio Electric Railway, and is unloaded into the cement shed, just north of the gravel washer. From the cement shed, it is wheeled to the 1-yard Smith mixer "M," under the same roof as the gravel washer, where it is mixed with the sand and gravel to form the concrete. It is transported from the mixer to the derricks "DD" over the track "CC," by three trains of two cars each, hauled by two Fate, three-ton, gasoline dinkeys. The cars are small platform cars, built by the Sanford-Day Iron Works, carrying 1¼-yard dump bottom buckets.

The derricks lift and swing the buckets, and dump them into the forms for the concrete structure. The latter is indicated in outline in figure 53 by dashed lines. The sweep of each derrick boom is indicated by a dashed circle. These circles lap each other, as shown, so that one derrick begins to serve where the other leaves off.

The boulders from the gravel are separated by a "grizzly" or grating at the mouth of the hopper at "H," and loaded into dump buckets. They are then washed by a water jet, run to the derricks and dumped as "plums" into the concrete in the forms. The larger stones from the bed rock, which have to be removed from the top layers to get to solid foundation, are similarly used.

Each of the two guy derricks, which are alike, has a tall mast of latticed steel 120 feet in height,

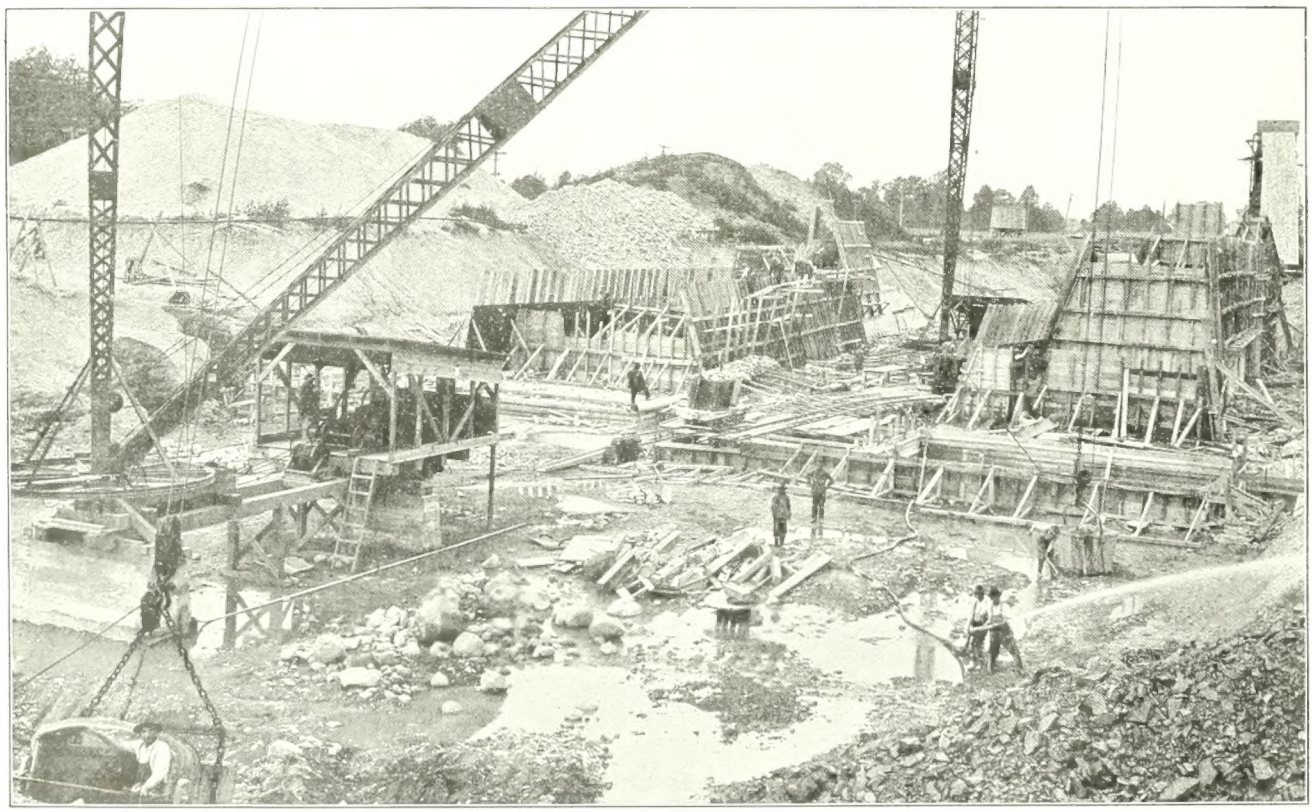


FIG. 54—THE WORK AT LOCKINGTON FROM A POINT NEAR THE DRAGLINE EXCAVATOR

The foreground shows how level tthe top of the bed rock lies, the lighter portions being pools of water. Much of this bed rock only needs to have the top surface washed clean. The downstream derrick is seen at the left, the hoisting drums and motors being housed in the shed. These derricks have 120 ft. masts and 105 ft. booms. The two heavy walls seen going up will be 82 ft. in height. The standing wave pool will be about in the center of the picture. The stream of water in the foreground is washing "plums" to be dropped into the mass concrete. The dragline bucket appears in the lower left corner.

with a latticed steel boom 105 feet long, and is operated by an electric hoist. (See figures 52 and 54). With a boom of this length, buckets can be handled and concrete placed anywhere in the width of the excavation, and in the walls at any level from the rock foundation to the top, 82 feet higher. Besides placing the concrete, these derricks move and set the sectional forms in which the concrete is placed. The south derrick, in addition, handles the rock which is excavated from the foundation.

As in most such construction, some ground water collects in the excavation and must be continually removed or it will flood the work. This is done by two pumps, shown at "P" and "P'." At "P" there is also a third pump for emergency use. Some of the water is used to wash the gravel and in mixing the concrete. For this purpose, it is collected in a pit or sump, so marked in figure 53. From that it is pumped to the screens at the top of the gravel washer. If the supply in the sump is low, it is filled from water in the south end of the excavation by the pump at "P." Excess water is discharged by both pumps over the embankment into Loramie Creek. A tank "Z" filled from the north pump furnishes a reserve supply for concrete mixing.

In connection with the building of the forms for the concrete, and the necessary repairs to equipment during construction, a carpenter, blacksmith and machine shop has been built. This is conveniently located a little northwest of the gravel washer. It is served by an extension of the concrete track "CC," enabling lumber, machinery, repairs, etc., to be conveniently transported from the shop to the work. The electric railway spur is extended north from the gravel washer, permitting lumber to be brought in from the Western Ohio Electric line, and stored conveniently in the yard "L."

With the exception of the dinkeys all of the machinery is driven by a 3-phase, 60-cycle alternating electrical current. This is tapped at Piqua from the Dayton Power & Light Company's station. It is obtained at 2300 volts, stepped up to 33,000 volts by transformers, and transmitted five miles to the dam over a pole line built by the Conservancy District. Here it is stepped down again to 2300 volts for use by the large pump motors. For the rest of the machinery, it is stepped still further down to 440 volts at a second transformer station. With the completion of the new transmission line of the Dayton Power & Light Co. from Dayton to Piqua, this power will come from their new large plant at Miller's Ford in Dayton.

The work at Lockington is being carried out under the direction of Barton M. Jones, Division Engineer, aided by C. H. Shea, Assistant Division Engineer. The electrical work was installed under the supervision of Frank Harvey, Chief Electrician for the District.

District Medical Service and the Influenza

The men in charge of the carrying out of the Miami Flood Control Project feel that in the interest both of the work, and of that finer co-operative spirit which is the distinguishing mark of modern industry, the Conservancy District should use all proper diligence in looking after the interests of those who become disabled in its service, through either sickness or accident. It takes great care to prevent the occurrence of either, and when they occur, to attend to them as speedily and as efficiently as possible. Before the work of construction began, steps were taken to secure the services of a man who should give his entire time to these matters. From among a number of men considered, Dr. W. M. Smalley, a physician of experience and ability, was selected. He was given an office in the Headquarters Building, where he could keep in close touch with all the camps and centers where work was being done. A local physician in each of these localities was also chosen, to act on emergency calls which Dr. Smalley himself could not immediately reach. The camp overseer or superintendent on the work was held responsible for first aid in all cases that might occur, with the added duty of seeing that both the emergency physician and Dr. Smalley should be notified at once. The physicians selected were Dr. Furnas of Englewood, Dr. Riley of Vandalia, Dr. Gabriel of Lockington, Dr. Kemper of Germantown, and Dr. Sayler of Vandalia, the latter consenting to remove to Huffman and give all his time to the Conservancy work there. Whenever necessary, these men are called at once. Dr. Smalley also gets to the case as soon as he can. If it is serious, and if the worker has no home of his own where he can be cared for, or if better than home care is necessary, the patient is removed to St. Elizabeth's or the Miami Valley Hospital, or the local institution at Piqua, where he remains as long as the case requires.

As regards compensation, a distinction is made between cases of injury and cases of sickness. An injured workman is compensated in accordance with the Workmen's Compensation Act of Ohio, which provides, in general, that after one week, the employee shall receive two-thirds of the pay which he received at the time of the injury. This arrangement lasts until the employee is again able to work.

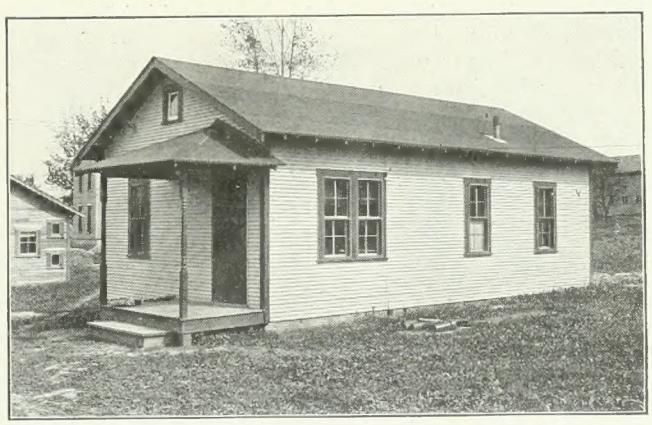


FIG. 55—FIRST AID HOSPITAL AT HUFFMAN

This Hospital, 30½ by 18 feet in size, contains a ward room accommodating three beds, a kitchen, an office and an operating room with the necessary supplies and appliances. See Figure 56.

In case of permanent loss of a member like the foot or the finger, compensation is made in a lump sum commensurate with the loss. In case of total disablement, the worker receives payment in the nature of a pension, payable at regular intervals as long as he lives.

For cases of sickness the District does not assume financial responsibility. Such cases involving an employee or a member of his family are visited by Dr. Smalley on his regular inspection trips, however, and for these visits no charge is made. Medical advice in general on these trips is free. For special visits payment must be made.

The results of the system outlined have been excellent. There has been no case of major accident. Injuries have been confined to minor cuts and bruises, which in most cases have been quickly cured. Likewise there has been no case of serious sickness. The endeavor has steadily been to head off the sickness so that it could not occur.

The application of this systematic vigilence to the influenza is worth noting.

At the outbreak of the epidemic, steps were immediately taken by C. W. Porter-Shirley, District Camp Inspector, to see that the health at the various camps was properly safe-guarded. It was arranged that Dr. Sayler, Camp Physician, at the Huffman Dam, should visit the cottages at Huffman, Taylorsville, and the railway relocation camp at Osborn, every day. In a similar way Dr. Smalley has visited the camps at Englewood and Germantown. The Lockington camp has been visited by Dr. Gabriel, the emergency physician at the village. These visits were much more than perfunctory. The physicians have interviewed the workmen and their families, and given personal instructions regarding the nature of the disease, the symptoms denoting it, and the steps to be taken, emphasizing especially the necessity of prompt action and of calling a doctor at once. In addition, a circular was printed by the District, a copy of a letter sent out by the Division of Sanitation at Washington, D. C., regarding the subject. This was distributed throughout all the camps, with the request that it be read carefully. The circular was, in effect, a repetition in print of the instructions and warnings which had been conveyed orally by the visiting physicians.

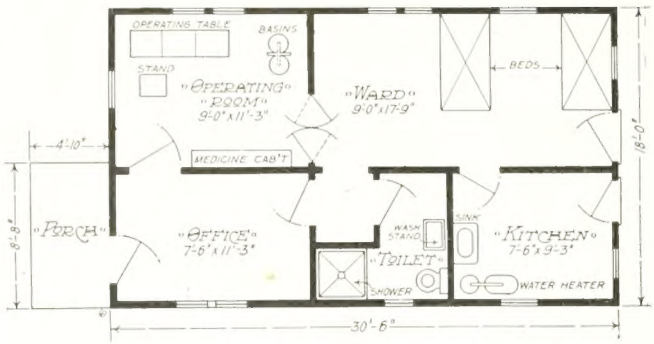


FIG. 56—FLOOR PLAN OF HOSPITAL

As a result the disease has appeared in only a few scattered cases, which have in general been easily handled. At Englewood there were seven or eight, at Huffman, three or four, at Germantown, five or six, at Taylorsville, only one or two. Of all these, only one or two of the Englewood cases have been severe. In the headquarters office at Dayton, there have been five or six scattering cases, only two of which were severe, and neither of these dangerous.

The only death which can fairly be attributed to the epidemic is that of a little girl, daughter, of a working man at the railroad relocation camp at Osborn. The number of Conservancy railway workers there being so small, it was out of the question to build a special camp for them like those at the dams. It is likewise practically impossible to enforce the same thorough-going sanitary regulations. We believe this fact is not without significance as showing the value of such camps as the District has constructed at the dams.

The Conservancy Schools

The Construction Camps of the Conservancy District being, except at Lockington, remote from towns, the children of employees cannot receive school privileges without special arrangements; and as many workmen, especially the more skilled, refuse to work where there are no educational facilities, it has been necessary for the District to establish four schools of its own. While these are being provided at the least practicable cost to the Conservancy District, it is hoped by an intelligent direction of the school policy to secure results which will be equal to those of the best city schools. Intelligent interest and co-operation often will secure what mere expenditure of money cannot. At Huffman, an existing schoolhouse has been loaned for the District's use. At Englewood, a summer residence, which later must be torn down, has been remodeled and will be used as a schoolhouse. At Germantown and Taylorsville, small schoolhouses have been built. Until these are ready, the school at Germantown will be held in one of the camp houses, at Englewood in one of the large cottages, and at Taylorsville in the farmhouse which had been used as the Division Engineer's Office. At Lockington the children attend the village school near by.

The District has been fortunate in securing experienced teachers. Miss May Turner is in charge of the Germantown School; Mrs. Eudell Everdell at Englewood; Miss Caroline F. Stearns at Taylorsville; and Miss Mildred Goss at Huffman.

The whole trend of modern education is in the direction of a more practical fitting of boys and girls to the parts which they will play later in life. The program for the Miami Conservancy Schools has been outlined in harmony with this view. It has been carefully worked out and it is felt that the result will amply justify the care which has been put upon the plan. Any parent, who may see his child doing things in school a little out of the ordinary, may take it as a sign of live education adapted to present date needs.

A successful school anywhere can only arrive by the co-operation of the parents. In the Conservancy

schools, this co-operation should be received to the fullest extent. It is hoped that in every camp, a man from among the carpenters can be secured to teach the boys how to use carpenter tools, and that good cooks from among the housewives will teach the girls how to cook and how to take care of the house. It is quite likely some of the boys will want to learn blacksmithing. In that case, it is hoped that a blacksmith can be induced to help them. Good schools, like good government, depend upon each interested person giving a hand. If we all do this, we can have the best schools in Ohio. The people of the Miami Valley are paying the cost of the work and they are right in demanding that not a cent be wasted in unnecessary expense, but the success which comes from every one helping as best he can adds nothing to the public burden, and makes possible results that money alone cannot secure.

Beginning the Hydraulic Fill at Taylorsville

The equipment for the hydraulic fill at Taylorsville has been installed and is now in operation. The general nature of such a fill has been described in the article on the Lockington dam in this issue. The equipment comprises three connected systems of pipes and pumps. One of these supplies water at high pressure to the "monitor" or "giant" at the borrow pit, to tear down the earth. The second supplies water in much larger quantity at low pressure to sluice the eroded earth down the borrow pit slope to the dredge pump. The third carries the mixed earth and water from the dredge pump inlet to the embankment of the dam, where the earth is deposited.

The borrow pit for a hydraulic fill is best situated on a slope, down which the water from the sluicing line can pass by gravity. At Taylorsville it lies on the hillside which rises from the east bank of the Miami River at the end of the damsite. The giant, built by the Joshua Hendy Co., is mounted on the hillside and throws a 2½-inch jet. (See figure 59). The 15-inch spiral steel high pressure pipe line supplying it is carried across the river on a railway trestle from a pump house on the west bank just north of the damsite, where it connects with two 6-inch Allis-Chalmers centrifugal pumps, each of 1400 gallons capacity per hour, and of 150-foot maximum head. They draw water from a sump connected with the river, and are so arranged that they can be connected "in parallel," thus supplying double quantity; or "in series," thus doubling the pressure to a maximum head of 300 feet.

The second pipe line, the sluice water line, passes from the same pump house to the borrow pit, beside the first. It is of 15-inch wood pipe, and is supplied by a 15-inch Allis-Chalmers pump of 5500 gallons capacity and 80-foot maximum head.

The third pipe line, the dredge pipe line, carrying the mixed earth and water from the borrow pit to the fill at the dam, is of 15-inch lap-welded steel, and is carried across the river on the same trestle which carries the others. It is fed by a 15-inch United Iron Works pump, located at the foot of the borrow pit, driven by a 350 horse power Allis-Chalmers electric motor.

The dredge pipe discharges into the hydraulic fill pool at a point near the south toe of the damsite. This pool, nearly three hundred feet wide, extends east and west about a quarter of a mile, nearly across that portion of the valley floor occupied by the damsite, and is retained in place by four embankments of earth. As the water from the dredge pipe spreads in the pool it drops its load of suspended earth. The bottom of the pool, gradually built up as the deposit proceeds, thus forms the top of the dam embankment. The retaining levees at the sides and ends are built up from the coarsest material from the dredge pipe as the bottom rises. Overflow from the pool is discharged back into the river through pipes which pass through the levee on the west bank of the river at the pool surface level, inflow and outflow being so regulated that the depth of water is maintained approximately constant at about six feet.

Night Schools Started at the Camps

The schools at the Conservancy Dams have opened prosperously. At Englewood, there are forty pupils; at Germantown, twenty-two; at Taylorsville, twenty-three; and at Huffman, twenty-four. The new schoolhouses at Taylorsville and Germantown are completed and in use. At Englewood the sessions are being held in one of the No. 4 camp cottages, pending the completion of the changes in the one which will be finally used. A small but well selected library has been added to the equipment of each school. The new schoolhouses at Germantown and Taylorsville are being used also for general community purposes, both of a social and religious nature. At Germantown regular church and Sunday School services are held.

A night school has been started at each of the camps for the special benefit of employees. The subjects include advanced mathematics; industrial arithmetic; penmanship; English for foreigners; mechanical drawing; and first aid work. The classes began Monday, October 21, and will be run for terms of twenty-four lessons each, meeting two evenings a week. The instruction is free, and it is hoped that many employees will receive the benefit to be derived from it. A special effort is being made to interest foreigners in the ideals of American life and citizenship. There will be occasional lectures at each camp, by men who will volunteer for this service.

October Progress on the Work

GERMANTOWN

The concrete mixer was started on October 5, and has been in operation since that date. The concrete is being placed in the floor of the outlet structure. A daily average of 100 cubic yards was made for the first week's run.

Good progress has been made by the carpenters on the movable forms for the conduits. At the same time forms for the floor sections of the outlet structure have been built ahead of the concreting.

Excavation by the dragline for the new channel and conduits has been continuous throughout the month. At this writing the excavation for the outlet structure has been completed, and that for the conduits started.

The graveling of the highway from the Germantown State road to the Camp has been completed. The camp streets have been gravelled and the necessary gutters constructed.

The division engineers held their monthly meeting at Germantown on the 16th. The morning was spent in inspecting the Germantown job and the afternoon in discussion of various problems connected with dam construction. The latter was preceded by a lively experience meeting in stimulation of the Liberty Loan drive.

The Liberty Loan drive started on September 26, with noon speeches by Mr. Morgan and Mr. O'Brien of the Dayton office. The sale of bonds for the Germantown feature has amounted to $14,000.

Arthur L. Pauls, Division Engineer.

ENGLEWOOD

The large dragline, excavating for the outlet conduit, has reached the upstream portal, and is cutting an incline for itself as it progresses, to enable it to cross the river. It will be only a very few weeks until the excavation for the outlet conduit, amounting to more than 11,000 cubic yards in earth and 43,000 cubic yards in rock, will have been completed. About 20,000 cubic yards of the rock from this excavation has been placed as a buttress at the downstream toe of the dam, just east of the river. This disposition of the rock was simply a convenient method of putting otherwise worthless material in a place where it would form a buttress to prevent any possible wash of flood water, discharged through the conduit, from reaching the dam.

Concreting in the outlet conduit has progressed favorably. The floor of the pool at the discharge end, where the hydraulic jump will take place, is nearly completed. Portions of both the weirs are concreted, as are several sections of the lower conduit. The floor of the conduit has progressed to a point beyond the center of the dam; in other words, it is more than half finished. A progress of 38 cubic yards per hour was maintained recently on this work for several hours. The partition wall, to control the flow from the outlet, is well under way.

The rock foundation for the outlet conduit, which is a most vital factor in the safety of the work, has proved upon excavating to be even more solid than preliminary investigations had indicated.

In order to utilize with the utmost economy the time available for construction, and to commence the actual construction of the dam before the river can be diverted through the outlet conduits, a portion of the dam east of the river will be started first. To prevent the hydraulic fill in this portion from spilling into the river, a cross dam is being constructed, extending across the dam from toe to toe along the river bank, and forming an earth retaining wall. The material for the cross dam is being excavated by a large electric dragline in the alluvial flat upstream from the dam. The character of this material, with its layer of clay on top and gravel beneath, makes it ideal for hydraulic purposes. The dragline bucket works a face extending well below the standing water level and as the material comes up it is in a saturated condition. Transported to the dam in 12-yard dump-cars, the earth is dumped along the toe of the cross dam and worked into place by a second large electric dragline. To insure a complete puddling of the material, a hose from a 4-inch pipe line is continuously played upon it as it is deposited in place—making mud pies on a large scale, but a most effective method of compacting earth fill.

A second cut has been started in the gravel pit, where a small dragline, on caterpillar traction, is loading into 12-yard cars for transportation to the screening plant. Daily tests are made of the sand and its quality is proving all that could be desired.

Mr. Morgan has moved from the cottage occupied by him to enable this building to be utilized for the camp school. With comparatively little remodeling a well-appointed school building can be produced. Work on this is progressing.

H. S. R. McCurdy, Division Engineer.

LOCKINGTON

Good progress has been made during the month on the concrete structure, the total quantity placed to date being 6300 cubic yards. The largest single day's run has been 365 cubic yards. Starting from the north end, the floor of the channel and the bases of the retaining walls have been poured to a point about 50 feet south of the center line of the dam. Concrete has been placed in the walls to a maximum height of 35 feet. A second Plymouth gasoline locomotive is now at work with the concrete equipment. Gravel for the washing plant is being excavated by the Class "K" electric Lidgerwood dragline, and loaded directly into cars, which are hauled to the hopper. This gravel comes from the necessary conduit excavation. A Class "B" Lidgerwood steam dragline is being erected just north of the large storage pile of gravel, east of the outlet excavation. This machine, when completed, will load the gravel upon the cars, thus releasing the larger Class "K" machine for other work.

A few teams have begun the grading of Road No. 9, connecting the Lockington Road just south of the dam site with the Turtle Creek Valley Road.

A contract for repairs to the State Dam at Port Jefferson has been awarded to Price Bros. of Dayton, and work will start on it about November 1. This work, together with minor repairs to aqueducts along the Miami and Erie canal feeder, will be necessary before water from the canal can be obtained from the state for operations at the dam. The water will be needed next year for the hydraulic fill.

Forms for the flaring entrance to the concrete outlet conduits are being erected. A new improved screw conveyor, to perfect the separation of the sand from the admixed water as it comes from the fine screen of the gravel washer, has been built at the District shop at Dayton, and will be immediately installed. The shop and warehouse building has been enlarged about 50 per cent.

B. M. Jones, Division Engineer.

TAYLORSVILLE

During the past month, about 5,000 feet of camp road has been graded and surfaced with gravel. This practically completes our system of camp roads. About 1,500 feet of Road No. 12, which runs northwesterly through the camp, connecting the public roads east and west of it, has been graded and now is being graveled.

The schoolhouse and the hospital are practically finished.

The 15-inch dredge pump, direct connected to a 350 H. P. electric motor, has been installed on the east bank of the Miami River. A 15-inch high pressure, spiral pipe line has been completed crossing the river connecting the pumphouse on the west bank with the monitor or "giant," which will wash down the earth in the borrow pit on the east bank to the dredge pump. A low pressure pipe line for the sluicing water has been laid along side the other. The pumps connecting to both these lines have been installed in the pumphouse on the west bank. The 15-inch dredge pipe, running from the dredge pump on the east bank across the river to the south toe of the dam on the west side, has also been completed. The entire system has been tested out, and the hydraulic fill at the dam is about to begin. Some ground sluicing has already been done, in filling the east end of the cut-off trench.

The gravel washing plant is nearly ready for the machinery. **O. N. Floyd, Division Engineer.**

FIG. 57—EXCAVATION FOR THE CONDUITS AT ENGLEWOOD

The floor of the excavation is already concreted as far as the inclined concrete chute. The excavation is in Cincinnatian shale rock. Two temporary conduits will be built side by side just above the floor, and the two permanent conduits will be built just above these.

HUFFMAN

Three new cottages have been built to supply the increased demand. All of the cottages have been put in shape for winter, and a coal shed built for each one. A steam plant to supply steam for cooking and heating in the mess hall, and heating the office and store room, has been put in operation during the past month. The camp roads have all been surfaced with gravel. A carpenter and blacksmith shop has been built, and the machinery installed.

A well drill has continued drilling holes for blasting the rock excavation for the outlet works, during the entire month. Blasting began about the 15th of October.

The placing of the impervious blanket on the upstream side of the dam has continued, and is nearing completion.

6,500 cubic yards have been excavated for the entrance channel to the outlet works. 4,000 cubic yards of ballast gravel have been excavated with a drag line, loaded on cars, and distributed for ballasting the temporary relocation of

[illegible] Lower Railroad. A crew of our men have been ballasting this track since October 2, and getting it in shape to carry traffic so that excavation for the outlet works can be started.

C. C. Chambers, Division Engineer.

DAYTON

Channel excavation on the east side of the Miami River above Herman Avenue Bridge is nearing completion. The levee embankment and trimming of slopes will be finished as soon as the smaller dragline machine is available for handling material. The mouth of Mad River has been cut through on its permanent location and the point of the Herman Avenue spoil bank opposite this location has been graded.

A total of 198,000 cubic yards of channel excavation has been moved, 52,000 cubic yards of which have been handled more than once. 51,000 cubic yards of this levee have been placed in final position, 4,000 in levee embankment and 47,000 in spoil bank and channel fill.

McWilliams Northern Dredging Co. has placed 25,000 cubic yards of levee embankment on the Miami River work above Island Park.

Building of the steam tug is well under way.

Sunset Avenue Dam is complete except for the flash boards and the making of the fill at the west end, which is now being placed.

Dragline No. 789 is making the fill at the site of the concrete block factory, and placing a stock pile of gravel for use in making the blocks.

Plans are being made for construction of a dry dock at Sunset Avenue Dam.

C. A. Bock, Division Engineer.

HAMILTON

The Class 24 Bucyrus dragline is continuing its work on Riley's Island. It has made a second trip through the island during the past month and is now returning toward the north along the east bank of the river. On its way it will flatten out the slope of the bank and finish the top of it to a uniform grade so that it can be made into a roadway in the future at a minimum expense. The total quantity of earth moved to date by this machine is about 160,000 cubic yards. This has lowered the low water surface at the north end of the island between 6 and 7 feet. The dragline will continue its cutting in the river north of the island while the weather is favorable and will then start a cut on higher ground where it will be able to work to better advantage during the high water season.

The Class 14 steam dragline is building a railroad embankment along the east side of the river between the city sewage pumping station and the Columbia bridge. Track laid on this will carry trains which will be loaded by the large dragline with material excavated from the river. This work will be completed in the near future and the machine will move to the north end of town to begin work on the headrace for the new hydro-electric power station.

The work of track laying on the loading and dumping tracks has been resumed and will now be completed in a short time. A 3500-foot transmission line has been built for lighting these tracks and the coal storage yard.

[illegible] sewer about 250 linear feet has been completed and the excavation carried to grade about 75 feet ahead of this. The excavation is retarded by a layer of tough blue clay about 4 feet thick which is encountered about 8 feet below the surface. It is necessary to loosen this material before the clamshell can excavate it and this has been done mostly by hand. During the past week dynamite has been used with moderate success. The clay stratum appears to be getting thinner, and indications are that it will run out.

The automatic recording river gauge which is now at the City Engineer's office is being moved to the Conservancy office. The U. S. Weather Bureau thermometers and rain gauge will also be taken over by the District. A. F. Griffin will be the observer.

The shop machinery is now in running order and is being used almost continuously for sewer forms, blacksmithing and miscellaneous work.

A contract has been awarded to Horace Shields for clearing, sawing lumber and cutting piles on the west side of the river. This work has been begun. It is expected that over 100,000 feet of lumber will be cut.

C. H. Eiffert, Division Engineer.

RAILWAY RELOCATION

Erie and Big Four—The Big Four temporary main track to carry trains around the work on the concrete structure at Huffman Dam has been completed, and traffic is operating over it. Gravel for ballasting it was excavated from the channel of Mad River at the dam site by the Lidgerwood steam dragline. One steam shovel is working in the 700,000-yard cut at Huffman Hill, excavating approximately 4,000 cubic yards of solid rock per day, in two ten-hour shifts. Drilling and blasting are carried on ahead of the shovel. The levees across Huffman Retarding Basin are 50 per cent completed. The railway grading from Mud Run to Enon is finished. The contract has been let, and work begun, on the water-bound gravel surface of the highway changes at Mud Run, and southwest of Fairfield. Excavation for the channel change in Mad River at Harries, above the dam of the Dayton Hydraulic Co., is well under way. This is being done by a ¾-yard clam shell bucket operated by a revolving derrick, mounted on a wide truck.

The concrete work on the double underpass, carrying the highway and the Ohio Electric Railway under the steam railway lines, just west of the damsite, has been completed, and work on the steel structure will begin within the next two weeks. Six concrete culverts are finished, and 8 others well under way. Two concrete pipe culverts are also completed.

Baltimore and Ohio—McAndrews Bros. have completed their contract, including about 30,000 yards a little north of Dayton, and are loading up their equipment to move out. Kahl Bros. have completed about 100,000 yards of grading about 2 miles south of Johnson Station, and now have both their shovels at work in two cuts, totaling about 70,000 cubic yards, a little further north. The La Boiteaux Co. is working on the 12-foot concrete arch about 2 miles south of Johnson Station, on which they have completed the footings. The 6-foot arch

south of this, and the 8-foot arch north of it, they have completed. The Vang Construction Co. have the 20-foot concrete arch at Johnson Station and the 30-foot concrete arch at Poplar Creek completed up to the springing lines. The Vang shovel, at work in the 135,000-yard cut just north of Johnson Station, is progressing very favorably. The other Vang shovel is working in the side hill cuts along the river about 2½ miles north of Dayton. Condon & Smith's shovel, in the 97,000-yard cut north of Taylorsville, is making excellent progress. They now have three 12-car trains at work hauling dirt to the fill south of Tadmor, moving about 1,500 cubic yards per day. Miller Bros. have completed the footings for the 26-foot arch at Picayune Creek. They also have a gang concreting head walls for culvert pipes from Tadmor to Picayune Creek, and have begun excavation for the 8-foot concrete arch just north of Taylorsville.

E. N. Floyd, Division Engineer.

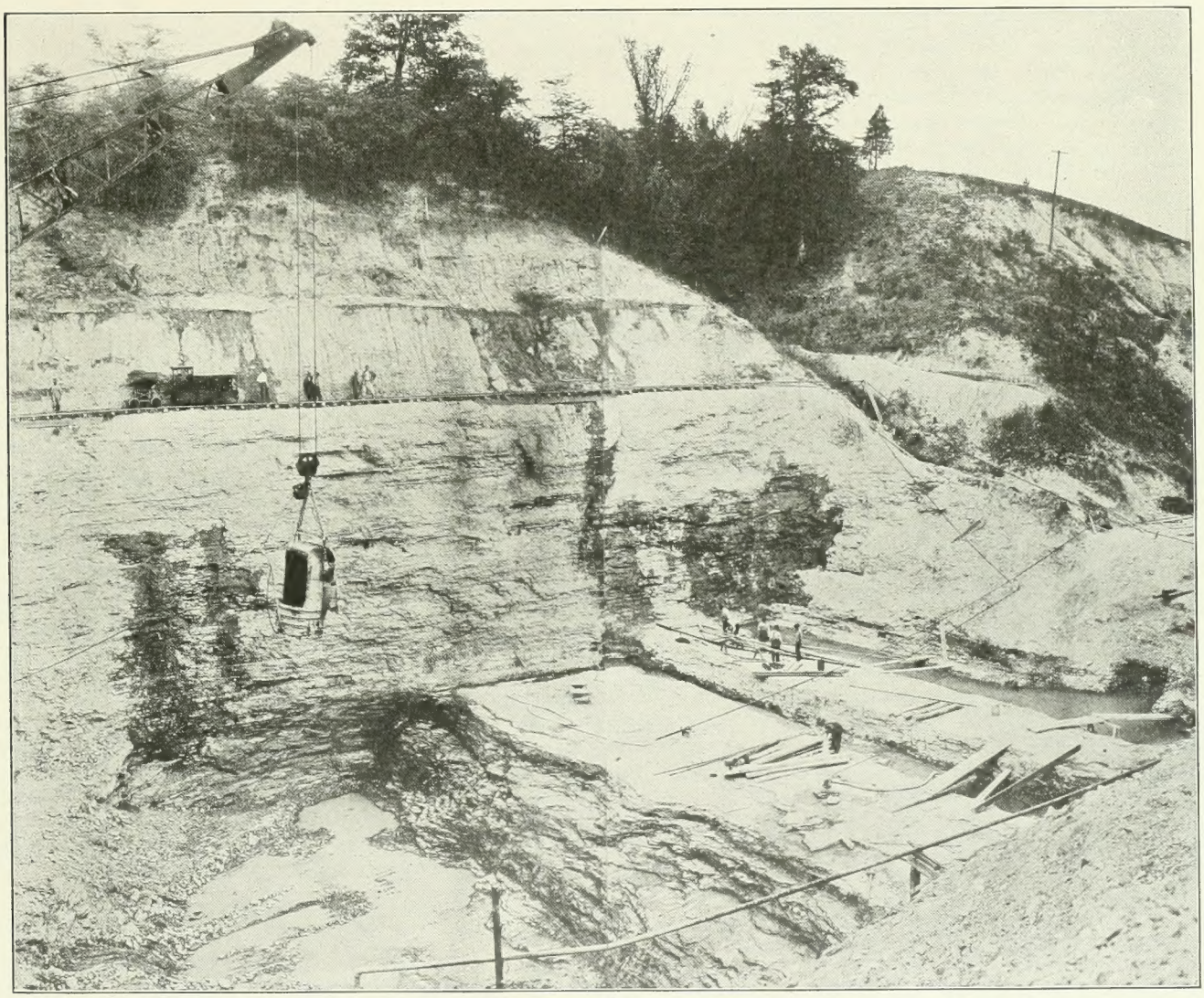


FIG. 58—EXCAVATION FOR OUTLET STRUCTURE AT GERMANTOWN DAM

The excavation is in rock on the further side to about the level of the men's heads who stand on the railway track. The pool of water at the left below is at the bottom of what will be the standing wave pool. The rock floor in the center will be just below the bottom of the lower pool. The excavation just beyond it is for the lower weir. The men are just beginning construction of the concrete forms. The concrete is now being brought in over the three-foot gage light railway track by tthe gasoline dinkey and cars. Fig. 60 shows the same work three weeks later.

An interesting item, showing the importance of little things on a large job like that of the Conservancy District, was among the matters considered at the last meeting of the Conservancy Engineers. Empty cement sacks are now worth 25 cents apiece. It is customary to return these to the manufacturers and receive the credit on the account. It is estimated that the total credit on the Conservancy work on this item will be $500,000. There is always a loss of sacks, due to tearing and other causes, amounting to from 5 to 10 per cent. The difference between these two figures represents, on the Conservancy job, $25,000, a snug little sum, which can be saved by care.

Beginning the Concrete Structure at Germantown

The work of pouring concrete for the outlet structure at Germantown was started on October 5. The function of this structure in the Conservancy Dams was explained in the September bulletin. The concrete shown in figure 60 will form the floor of the standing wave pool and of a second pool just below it which receives the water from the first. Part of both weirs connected with the pools is also shown. The location of the outlet is on the valley floor a little north of the present stream. The excavation here, as at the other dams, is carried down to solid rock in the Cincinnatian shale. The structure is being built in "the dry," as at Lockington, and connection with the creek will be made after the work is completed, saving the cost of cofferdams. The entire structure will be 850 feet long and 105 feet in maximum width and will contain 17,900 cubic yards of concrete. It does not include the spillway, which at Germantown is separate from the conduits. No difficulties have occurred in getting satisfactory foundation at the expected level. The gravel for the concrete occurs conveniently at the edge of the stream a few hundred yards above the work in progress, and at a level only a few feet below the valley floor. It makes a concrete of unusually satisfactory quality. The concrete is mixed in a 1-yard Smith mixer located at the gravel washing plant a few hundred yards up the valley, and is transported to the work in 1¼-yard hopper cars running on a 3-foot gage track laid on a shelf excavated on the north slope of the valley. (See figure 60). This permits the discharge of the mix through inclined chutes to the work below, obviating the use of hoists or derricks. (See also figure 58.)

How the Loan Went Through

With a running start, beginning four days before the actual date set for the drive, the figure at the end of the first day stood at $33,000, the sums running, for the eight District centers, from $2,000 to $8,400. This represented the result of meetings at various centers, at which effective appeals were made, among others, by Mr. Carl Lentz, former prosecuting attorney for Montgomery County, by Mr. W. G. Pickrel, of Dayton, by Mr. Bernis Brien, Sales Director for Liberty Loan in Montgomery County, and by Mr. Morgan, Chief Engineer of the District. It represented also community team work in the way of flag-raisings, children's choruses and music contributed by the good women of the camps. Behind it all was the hard, personal work of the Loan Committees, headed by Messrs. Matthes and Wilcock of the Dayton office.

It was an excellent start, but as is usual in such cases, the first days had skimmed the cream, and subscriptions fell away rapidly. Nevertheless, by Sunday, October 6, the figure stood at $70,000, with two weeks yet to run. That the District would reach the mark set, $100,000, with a large "factor of safety," was practically certain.

Quite naturally it fell asleep the second week. By Sunday, the 13th, it had only grown to $81,500, an increment for the six-day working period of $11,450, a little more than one-seventh of the amount gained the week before.

But in spite of this, four-fifths of the sum set had been subscribed and in two-thirds of the working time. The District was well ahead of the nation, and with an effort could be pushed far over the top. The leaders determined to put it there. There had been plenty of wholesome rivalry between the various camps. All it needed was stimulation. The regular meeting of the Conservancy Engineers for the discussion of construction problems came the middle of the last week. The first order of business was turned into a Liberty Loan experience meeting, with exhortations to the lagging brethren, the latter directed principally, truth compels us to say, toward Englewood, while the virtuous chuckled. It worked perfectly. Englewood, unaccustomed to a rear pew, went home with blood in its eye, and took its place among the redeemed the next day at a special noon meeting, by adding $14,000 to its previous figure inside of an hour. The rest of the District was hard at work at the same time, so that the subscriptions ran to $42,350 for the one day, making the grand total over $140,000. The last two days of the campaign were spent in rounding up the stragglers, bringing the figure to its final mark—$147,600.

Following are the contributions of the various divisions of the Conservancy work. The first five are the dams, ranked according to the amount of bonds bought per dollar of payroll, the only fair comparison, the standings being given in the last column. The last three divisions cannot well be compared, owing to differences in conditions.

Lockington	$ 16,450	100
Huffman	11,750	67
Germantown	15,450	56
Englewood	22,350	50
Taylorsville	14,450	47
R. R. Relocation	30,650	
Hamilton	9,100	
Dayton	27,400	
Grand total	$147,600	

It will be seen that Lockington once more is far in the lead. She took $150 in bonds for every man on her working payroll, and $1.50 for every dollar she earned during the three weeks of the drive. To Messrs. Jones and Shea and to Smith, the "ace of Lockington," who sold $4,400 alone, special credit is due. Englewood must be given special mention also for its $14,000 per hour, the speed record of the drive.

Seen and Heard at the Camps

SURPRISE PARTY AT LOCKINGTON

A Pleasant Time Is Had by All.

On Tuesday, October 8, a prominent young lady at the Lockington camp awoke with a violent tooth ache, which obliged her to seek the services of a dentist in Piqua. Arriving in Piqua she told the chauffeur that his services were no longer needed, as she would return by the electric car. She failed to appear, however, nor was anything further heard of her until a telegram was received in the camp by her parents that evening, announcing her marriage the same day at Newport, Kentucky, to one of the Lockington young men. That was on Tuesday. On Wednesday, the young couple returned, received the parental blessing, and on Thursday, October 9, settled down to happiness and housekeeping in one of the camp cottages. The young lady was Miss Maude Bolton, daughter of Mr. and Mrs. J. W. Bolton. Mr. Bolton is superintendent of the work at the Lockington Dam. The young man was Mr. Frank Morrin, who is assistant stock keeper on the work. The Bulletin extends congratulations. For speed and pep this leaves Englewood far in the rear.

STILL THEY COME

The tide of population at Taylorsville continues to rise. A son was born on September 30 to Mr. and Mrs. William Daniels. A boy was born to Mr. and Mrs. T. D. Berryman October 1. Dayton contributed its quota in the person of a girl baby, born to Mr. and Mrs. R. B. Clement, on October 14. Mr. Clement is Office Engineer on the Dayton River improvement work.

Continuing the subjects of infants, we understand that Hamilton is somewhat peeved because the Bulletin passed over their boy, who arrived several months ago at the home of Mr. and Mrs. R. B. McWhorter. It is a remarkable child, as we can testify from personal inspection, but we submit that we cannot announce even the most remarkable infant until its arrival has been reported to us. The Bulletin congratulates all the parents.

Following the above comes Huffman, announcing the birth, at the Miami Valley Hospital, of a girl baby to Mr. and Mrs. J. S. Gena. Mr. Gena is Office Engineer at the Huffman Dam. Again the Bulletin congratulates. Between weddings and babies the Seen and Heard column is becoming just one congratulation after another.

An ice cream social was given by the Woman's Club of Taylorsville Dam on October 8. The proceeds are to be used for the Red Cross work. The sum of $39.00 was cleared above expenses, to which $30.00 was added by a subscription taken by Miss Lucy Mante among the men. The efficiency of the Taylorsville Woman's Club may be gaged by the fact that for one cake they got $6.50, the victim being Superintendent Sherwood. Special acknowledgment is due Mr. and Mrs. Mitchell for their work, and to Orin I. Carmin, the efficient auctioneer. Everybody turned out for a good time, and got it. The program ended with a dance.

War Service Notes

Kenneth C. Grant writes under date of October 22 that he has been placed in charge of construction at Camp Grant, Rockford, Ill., as Major, Q. M. C., Construction Division. The Camp is to be enlarged to take care of an additional 24,000 men.

Robert F. Eastman has written us an interesting letter about his work in the Coast Artillery Training Camp. He is now at Ft. Monroe, Va., having been transferred to this camp among the first ten men to pass the examination successfully.

A letter from J. F. Burkin, who is now a Sergeant in Battery F, 34th Field Artillery, Camp McClellan, (near Anniston, Ala.) indicated that he was as full of pep as ever, and anxious to get at the Hun. We hope he will have the opportunity, as we believe he would create a particularly hot environment for Huns in his vicinity.

L. Dubois has received a letter from Charles Altfillisch, who is now an instructor overseas among our boys, and doing good work. He writes of meeting James W. Cullen, another former Conservancy boy, and now a sergeant, on top of a mountain in France (probably in Alsace.)

The death was announced at Camp Sherman of John Layman on October 6, of influenza. He had been a worker on the Lockington Dam, and was not selected for the army until September 3. His father, Frank Layman, is also one of the Conservancy workers at Lockington. Mr. Layman's is the first name on the Conservancy Honor Roll to receive the gold star. The Bulletin extends its sympathy to the parents in their loss.

Lieut. K. B. Bragg, U. S. N., formerly with the Conservancy, and heretofore stationed at Pensacola, Florida, is now with the Bureau of Yards and Docks, Navy Department, Washington, D. C.

The following is from a letter written some time since by H. W. Wesle, now engaged in engineering work at Camp Jackson, S. C. (Artillery Corps.)

"A living man who never writes his friends is like a dead man without a tomb stone. . . Therefore this letter.

"I am now in the motor school. There we dug ditches, made roads, drilled, built fences, (fatigue work and rightly named), for a few weeks, and were then assigned to the special work for which we were fitted—cycle, truck, or auto driving, etc.

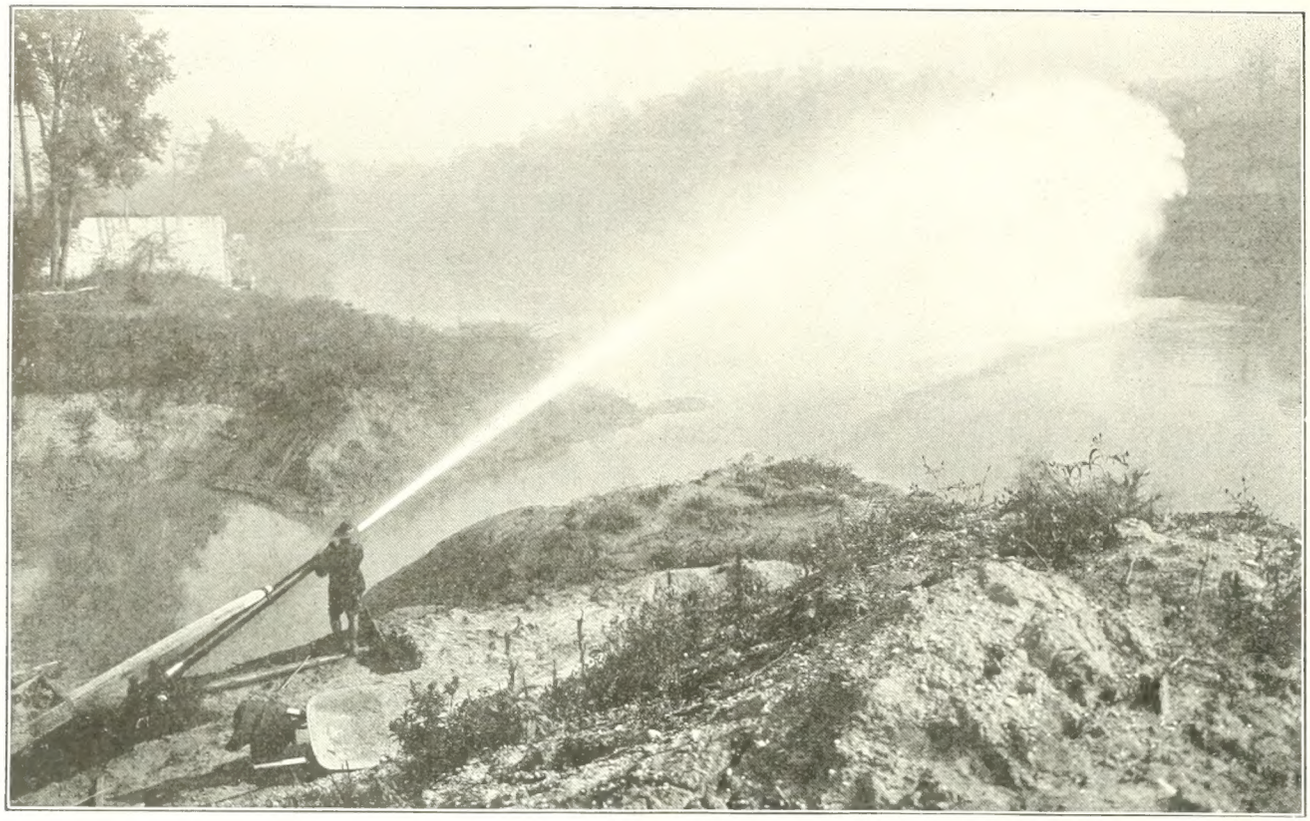


FIG. 59—TESTING THE HIGH PRESSURE PUMPS FOR THE HYDRAULIC FILL AT TAYLORSVILLE
The same "giant" (at the left) which will tear down t .e earth to make the fill. (See page 57.)

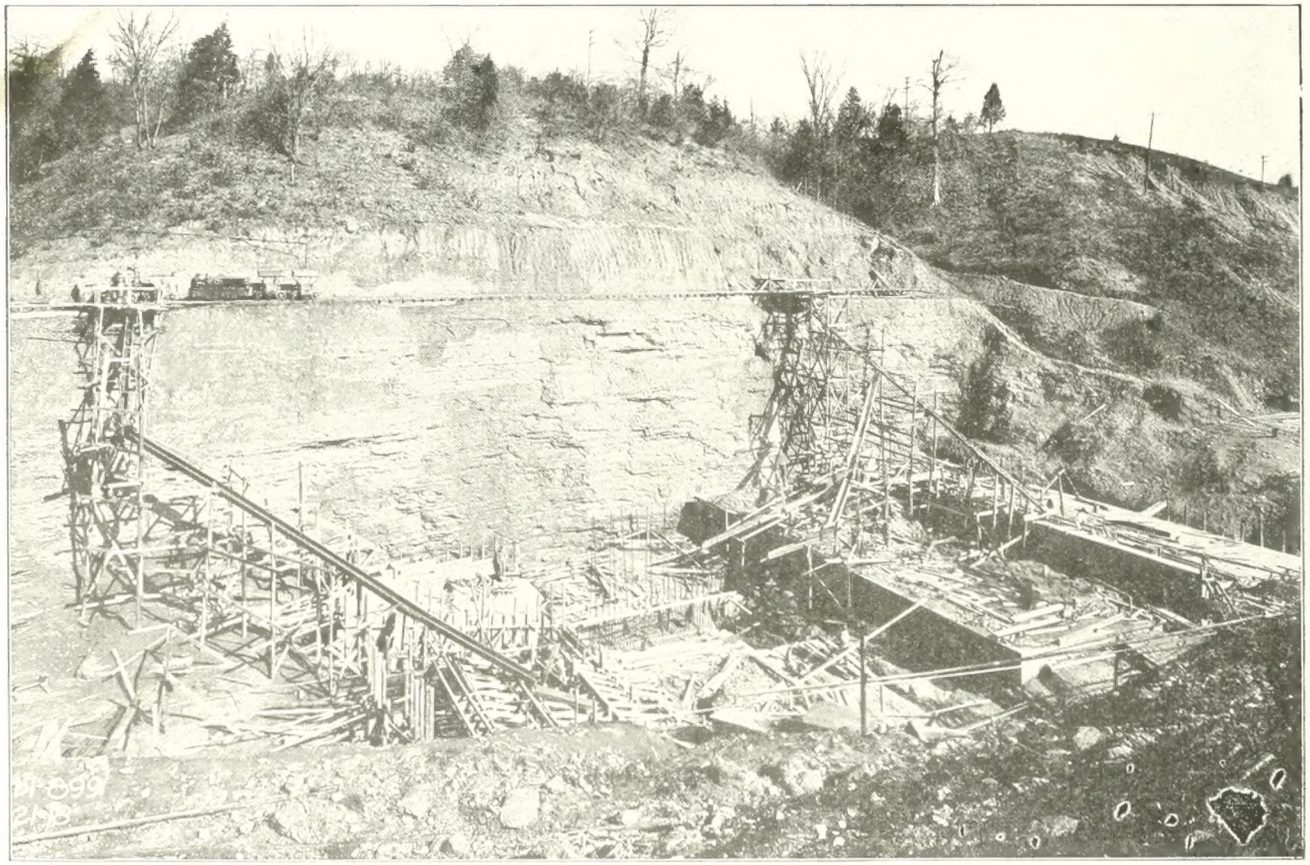


FIG. 60—CONCRETING THE OUTLET STRUCTURE AT GERMANTOWN